Sea. The focus of this agreement is to ensure that harvest of animals from this shared population is conducted in a sustainable manner. The Service works with the parties of this agreement, providing technical assistance and advice regarding, among other aspects, information on abundance estimates and sustainable harvest levels. We expect that future harvest levels may be adjusted as a result of discussions at the meeting between the IGC and NSB, held in February 2008.

We do have concerns regarding the harvest levels of polar bears from the Chukchi Sea, where a combination of Alaska Native harvest and harvest occurring in Russia may be negatively affecting this population. However, implementation of the recently ratified ''Agreement between the United States of America and the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population'' (Bilateral Agreement), with its provisions for establishment of a shared and enforced quota system between the United States and Russia, should ensure that harvest from the Chukchi Sea population is sustainable.

Comment 24: If the polar bear is listed, subsistence hunting should be given precedence over other forms of take.

Our response: As noted above, Alaska Native harvest of polar bears for subsistence is currently exempt under both the MMPA and the Act. Sport hunting of polar bears is not allowed in the United States under the MMPA, and take for other purposes is tightly restricted. For polar bears, the other primary type of take is incidental harassment during otherwise lawful activities. The Service has issued incidental take regulations under the MMPA since 1991, and these regulations include a finding that such takings will not have an adverse impact on the availability of polar bears for subsistence uses. Thus, the needs of the Alaska Native community, who rely in part on the subsistence harvest of polar bears, are addressed by existing provisions under both the MMPA and the Act.

Issue 5: Climate Change

Comment 25: The accuracy and completeness of future climate projections drawn from climate models are questionable due to the uncertainty or incompleteness of information used in the models.

Our response: Important new climate change information is included in this final rule. The Working Group I Report of the IPCC AR4, published in early 2007, is a key part of the new information, and represents a collaborative effort among climate scientists from around the world with broad scientific consensus on the findings. In addition, a number of recent publications are used in the final rule to supplement and expand upon results presented in the AR4; these include Parkinson et al. (2006), Zhang and Walsh (2006), Arzel et al. (2006), Stroeve et al. (2007, pp. 1–5), Wang et al. (2007, pp. 1,093–1,107), Chapman and Walsh (2007), Overland and Wang (2007a, pp. 1–7), DeWeaver (2007), and others. Information from these publications has been incorporated into appropriate sections of this final rule.

Atmosphere-ocean general circulation models (AOGCMs, also known as General Circulation Models (GCMs)) are used to provide a range of projections of future climate. GCMs have been consistently improved over the years, and the models used in the IPCC AR4 are significantly improved over those used in the IPCC TAR and the ACIA report. There is ''considerable confidence that the GCMs used in the AR4 provide credible quantitative estimates of future climate change, particularly at continental scales and above'' (IPCC 2007, p. 591). This confidence comes from the foundation of the models in accepted physical principles and from their ability to reproduce observed features of current climate and past climate changes. Additional confidence comes from considering the results of suites of models (called ensembles) rather than the output of a single model. Confidence in model outcomes is higher for some climate variables (e.g., temperature) than for others (e.g., precipitation).

Despite improvements in GCMs in the last several years, these models still have difficulties with certain predictive capabilities. These difficulties are more pronounced at smaller spatial scales and longer time scales. Model accuracy is limited by important small-scale processes that cannot be represented explicitly in models and so must be included in approximate form as they interact with larger-scale features. This is partly due to limitations in computing power, but also results from limitations in scientific understanding or in the availability of detailed observations of some physical processes. Consequently, models continue to display a range of outcomes in response to specified initial conditions and forcing scenarios. Despite such uncertainties, all models predict substantial climate warming under GHG increases, and the magnitude of warming is consistent with independent estimates derived from observed climate changes and past climate reconstructions (IPCC 2007, p. 761; Overland and Wang 2007a, pp. 1–7; Stroeve et al. 2007, pp. 1–5).

We also note the caveat, expressed by many climate modelers and summarized by DeWeaver (2007), that, even if global climate models perfectly represent all climate system physics and dynamics, inherent climate variability would still limit the ability to issue accurate forecasts (predictions) of climate change, particularly at regional and local geographical scales and longer time scales. A forecast is a more-precise prediction of what will happen and when, while a projection is less precise, especially in terms of the timing of events. For example, it is difficult to accurately forecast the exact year that seasonal sea ice will disappear, but it is possible to project that sea ice will disappear within a 10–20 year window, especially if that projection is based on an ensemble of modeling results (i.e., results from several models averaged together). It is simply not possible to engineer all uncertainty out of climate models, such that accurate forecasts are possible. Climate scientists expend considerable energy in trying to understand and interpret that uncertainty. The section in this rule entitled ''Uncertainty in Climate Models'' discusses uncertainty in climate models in greater depth than is presented here.

In summary, confidence in GCMs comes from their physical basis and their ability to represent observed climate and past climate changes. Models have proven to be extremely important tools for simulating and understanding climate and climate change, and we find that they provide credible quantitative estimates of future climate change, particularly at larger geographical scales.

Comment 26: Commenters provided a number of regional examples to contradict the major conclusions regarding climate change.

Our response: As noted in our response to Comment 25, GCMs are less accurate in projecting climate change over finer geographic scales, such as the variability noted for some regions in the Arctic, than they are for addressing global or continental-level climate change. Climate change projections for the Barents Sea are difficult, for example, because regional physics includes both local winds and local currents. Cyclic processes, such as the North Atlantic Oscillation (NAO), can also drive regional variability. We agree with one commenter that the NAO is particularly strong for Greenland (Chylek et al. 2006). However, the natural variability associated with this